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An original assessment tool for transparency in the public sector based on the integrated reporting approach

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Abstract: This paper aims to provide a transparency assessment tool, highlighting the importance of disclosing qualitative information to stakeholders to increase accountability in the public sector. The agency theory, stakeholders and legitimacy theory underpinning transparency in reporting as an enabler of public accountability ensure a more holistic approach in developing the disclosure framework. The main contribution of this paper relates to its methodology, comprising both quantitative and qualitative disclosures. The quantitative index was developed by overlapping the indicative metrics from the GRI guidelines and the structure of the six capitals defined by the integrated reporting framework. Furthermore, the information comprised under each capital has been analyzed by applying the qualitative characteristics of information recommended (GRI and IR), each one being deconstructed into several evaluation criteria. This study has practical implications, providing an assessment tool for enhancing public accountability throughout greater transparency in reporting by offering interesting opportunities for further empirical studies.

Keywords: transparency, accountability, disclosure, integrated reporting, public sector.

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1. Introduction

Most recently international crisis of government finances has adversely affected public confidence in the reliability of reporting. Improvements in governmental accounting systems play a significant role in increasing public trust. High-quality information on budgetary stability and governmental financial sustainability became essential to overcome the financial crisis affecting the public sector worldwide (Bolivar *et al.*, 2015). All these lead to “a wake-up call” for better accountability and governance, the two key reasons why transparent reporting is needed. In this context, international organisms have gradually taken various measures. Thus, the proposed International Public Sector Accounting Standards (IPSAS) (IFAC, 2013) seek to enhance the accountability of public sector entities by increasing transparency in governmental financial statements, while the IMF’s Fiscal Transparency Code (2014) aimed to strengthen fiscal surveillance, policy-making, and accountability. Furthermore, OECD (2015) issued more specific principles and recommendations for the overall budgeting framework, based on various pillars of modern public governance, which include transparency, openness and accountability.

Our paper addresses the newest reporting framework, namely the integrated reporting (hereafter <IR>), issued by the International Integrated Reporting Council (hereafter IIRC) and its intrinsic element, the sustainability reporting, issued by the Global Reporting Initiative (hereafter GRI). Integrated reporting was essentially created in response to stakeholders’ calls for enhanced disclosure of an entity’s strategy, governance, performance and prospects, thus allowing a better communication, while the sustainability reporting was meant to increase transparency regarding risks and opportunities faced. Despite all those efforts made in enacting transparency, a review of the prior literature did not reach very encouragingly results regarding the extent and quality of disclosures made by public organizations (Abu Bakar & Saleh, 2015). Most studies were focused on specific matters of sustainability such as environmental reporting (eg. Dumay *et al.*, 2010; Farneti & Guthrie, 2009; Frost *et al.*, 2005) or social reporting (eg. Ball & Bebbington, 2008, Guthrie *et al.*, 2010,), basing on the Global Reporting Initiative (hereafter GRI) framework. Accordingly, there is a lack of research focusing on an overall degree of transparency, bringing together detailed financial indicators, operational data and sustainability information.

These perceived gaps will be addressed in our paper, by developing a transparency assessment tool (i.e. disclosure index) for the public organizations based on the six pillars of the integrated reporting: financial, natural, intellectual, human, social,

manufactured and relationship capital. Although the same themes have been widely debated over the last decades in the private system (Eccles *et al.*, 2010; Eccles & Krzus, 2010), there is limited research in these fields in the public sector (Cheng *et al.*, 2014; Bartocci & Picciaia, 2013).

Basing on these premises, the primary *objective* of this study is to develop a complex index based on the integrated reporting framework, highlighting the importance of disclosing qualitative information to the various stakeholders, thus achieving greater transparency and discharging public accountability. Fulfilling accountability to a broad spectrum of stakeholders both internally and externally is a sustainability concern of great importance given the main provenience of money spent on public organizations.

This aim is addressed from a theoretical perspective, through three important stages of the study, exceeding prior research in this field from multiple points of view. Firstly, basing on the assumption that transparency is a fundamental element in enhancing public accountability, a holistic approach to this relationship, grounded in various theories (e.g., agency, stakeholder and legitimacy) is provided. Afterward, this study focuses on the importance of the qualitative side of disclosure, highlighting the main reasons why the information should be more relevant, comparable, timely and reliable, for the benefit of citizens, supervisory bodies and other stakeholders. Finally, we provided arguments sustaining our decision of using the integrated reporting framework as a basis for developing the disclosure index. Thus, this framework not only brings together the disparate disclosure requirements of regulators, markets and civil society, thereby seeking to reduce the reporting burden, but also emphasizes the interdependence between strategy, governance and social/environmental performance, thus offering deeper transparency than traditional financial reporting.

The originality of this study is ensured by the topic addressed, transparency and its power in enhancing accountability being of great importance, especially in the public sector. In this regard, we mainly contributed to the scientific literature by providing an original assesment tool for transparency, the methodology used in developing the disclosure index basing on the integrated reporting framework along with qualitative characteristics of information and grounded in theories such as the agency theory, stakeholders and legitimacy theory. Thus, by developing this assessment tool, we emphasized that existing indicators and metrics (for both financial and non-financial information) can be used, in the context of the new reporting framework (e.g. the six capitals) to measure the amount of information disclosed by the public organizations. Moreover, by combining a regulatory framework with prior literature results we provide perspectives for professional organizations and standard setters to issue specific guidelines and indicator database for certain topics (e.g. the intellectual capital) that are highly debated

among practitioners and in the academic environment, too. Another aspect, adding value to this paper, refers to the complexity of the assessment tool developed, comprising both quantitative and qualitative disclosures, motivated by our belief that it is not sufficient to accurately determine an aggregate disclosure level for assessing the degree of transparency as an enabler of accountability. The study addresses a wide range of users, from theoreticians, represented by the academia who wish to understand better the public accountability paradigm and the major role of disclosure, to the practitioners like public managers that may be enabled to discharge their accountability, by providing greater transparency. Furthermore, regulatory authorities might better formulate practical policies to guide public organizations on disclosing information to the diverse group of stakeholders.

The remainder of this paper proceeds as it follows. Firstly, we provide the theoretical background for transparency in reporting as an enabler of public accountability (section 2.1) basing on various theories (agency theory, stakeholders theory and legitimacy theory). Then we focused on the integrated reporting framework as a basis for a transparency index, but also providing a comprehensive overview of the qualitative characteristics of information and their importance in enhancing public accountability (section 2.2). Afterward, we focused on the integrated reporting framework as a basis for the disclosure index proposed (section 3), whose methodology of development is described in detail for both quantitative and qualitative metrics, basing on reporting frameworks (integrated / sustainability reporting) and argued by prior literature (section 4). Finally, the study concludes by highlighting the importance and usefulness of the transparency framework developed for the public sector.

2. Theoretical background

2.1 Theories underpinning transparency in reporting as an enabler of public accountability

In general, public organizations ought to be held accountable to the public as a whole, because public money mainly funds them through various means such as state appropriations, levies or loans. Thus, it is important for these organizations to be transparent about their activities, for enhancing public accountability (Abu Bakar & Saleh, 2015). Transparency refers to the availability of information about an organization that allows external actors to monitor the internal activity and performance of that organization (Grimmelikhuijsen *et al.*, 2013).

Accountability is a complex concept difficult to define, but in its broadest sense, it refers to the acknowledgment and/or assumption of responsibility for actions or

decisions and the obligation to report and provide explanations for resulting consequences. Accountability does not only imply providing information or answering questions but it is linked to concepts of fairness and ethics, and it extends to activities including setting goals, providing and reporting results and the consequences of making things right or wrong (Core, 1993). More concrete, "it is the concept that individuals, agencies, and organizations (public, private and civil society) are deemed responsible for carrying out their powers according to a particular standard (whether set mutually or not)" (Tisné, 2010). Consequently, public accountability encompasses two essential aspects, doing the right thing (reaching performance), thus being responsible for actions and giving an account of it throughout reporting. Therefore, *transparency* seems to be a major factor in enhancing public accountability.

Basing on this assumption, a thorough understanding of the interrelationships between accountability and transparency will be grounded in *theories* that will ensure a more holistic approach in developing the disclosure framework. Firstly, we underpinned the transparency-accountability relationship to the *agency theory*, as the traditional model based on creating and reporting value for the principal agent (shareholder). Subsequently, basing on the premises that a public organization interacts with specific stakeholders (citizens, taxpayers) we extended our vision towards the *stakeholder theory* and we finally focused on the *legitimacy theory* that considers interactions with "society" as a whole. Thus, we have started from the idea that transparency is an element of communication between citizens and public manager. In the light of the *agency theory* (Berle & Means, 1932), in fact, it is a tacit social contract, in which the principal (the citizen) delegates to the agent (the public manager) an activity of interest and monitors its achievement. The agency theory essentially acknowledges that different parties involved in a given situation with the same given goal will have different motivations that can manifest in divergent ways. It also states that information will always be somehow asymmetric between principal and agent. However, from the standpoint of agency theory an appropriate disclosure will offer information useful for the decision-making process, and moreover, it could provide a tool for shareholders and other investors to supervise decisive actions (Jensen & Meckling, 1976). These functions were subsequently extended to other interested parties by the stakeholder theory (Hill & Jones, 1992).

In fact, public sector accountability is not simply a one-to-one (principal-agent) relationship (Mulgan, 2000), but it implies different stakeholders whose economic and political interests overlap (Pilcher *et al.*, 2013). On the other hand, the identity of the principal influences the direction in which accountability is exercised that may be either upwards, to a higher authority or downwards, to citizens or community (Ferry *et al.*, 2015). Consequently, public organizations must rely on external stakeholders, namely taxpayers, to provide resource support and, in turn,

these stakeholders might require certain actions from these agencies. According to the *stakeholder theory,* the major objective of a public organization is to balance the conflicting requirements of the various stakeholder groups (Freeman, 1984), paying attention to all those relationships that can affect, or can be influenced by the achievement of the objectives (Freeman, 1999). Moreover, the normative perspective of the same theory emphasizes the "principle of responsibility", suggesting that by providing comprehensive disclosure to relevant stakeholders, public organizations fulfill both their duty and obligation to the wider society, thus discharging public accountability (Donaldson & Preston, 1995). This aspect is of great importance in the public sector where any organization would have difficulties in surviving as a going concern without the continuing support of its primary stakeholders (Clarkson, 1995).

While stakeholder theory focuses on how an organization interacts with specific stakeholders, *legitimacy theory* considers interactions with "society" as a whole (Chan *et al*., 2014). Legitimacy is a concept based on the perception or assumption that organizations seek to take desirable, proper or appropriate actions within the norms, values, beliefs and definitions of their societies (Suchman, 1995). In the public sector, there is a greater need for legitimacy because public organizations are an integral part of the society and their existence, continuity and growth rely to a large extent on the continuous support of its citizens by supplying resources. Thus, to gain or maintain legitimacy, organizations usually have an incentive to use communication strategies (e.g. disclosures) to influence societal perceptions and strengthen stakeholders' trust in government (Dowling & Pfeffer, 1975).

Consequently, legitimacy theory is a "systems-oriented" theory that underlies the explorations of the role of information and disclosure in the relationships between organizations, government and citizens (Gray *et al.*, 1996). In fact, this theory recognizes disclosure as an important means by which management can influence external perceptions about their organization (Deegan, 2002), therefore considering the use of disclosure as a legitimating device (Chauvey *et al.*, 2015). Basing on these theories, *transparency* is certainly an important factor in enhancing public accountability, this assertion being also scientifically grounded in prior literature (Haque, 2000; Koppell, 2005). Moreover, these studies focus on various characteristics of information, emphasizing the public need to have access to sufficient and meaningful information on the quality, quantity and cost of services provided and activities undertaken by public organizations.

In conclusion, transparency can improve accountability in certain contexts, the quality and type of data that are made available determining whether it can be used effectively for accountability purposes (Ferry & Eckersley, 2015).

2.2 Public accountability in light of transparency index

Public sector entities can effectively and efficiently achieve accountability by disclosing relevant and useful information concerning their activities to all interested parties for preventing corruption and wasting of public recourses but also for building a trustful relationship between citizens and their governments (Lourenço *et al.*, 2013). In other words, transparency and accountability stimulate a "culture of openness" within organizations (Hood, 2006), and are being seen as the key elements for enhancing good governance in the public sector and for creating a positive political and social environment (Abu Bakar & Saleh, 2015).

Public transparency has recently begun to expand beyond the tax line, thus addressing other aspects of public management (e.g. performance, sustainability, social or environmental reporting). Data becomes information only if it can be used in the decision-making process by exerting influence over the user's decisions and actions (Bititci, *et al.*, 2012).

Consequently, new requirements for public accountability aroused due to this expansion, so that a wide range of information to be accessible to the stakeholders through financial statements, annual reports and even via websites. For this purpose, a strong emphasis has been placed on issuing reports (e.g. sustainability/integrated reporting) able to combine the financial orientation with non-financial aspects for increasing the efficiency of the reporting process. Several frameworks have been issued on this matter (e.g., IIRC & GRI) for improving the quality of information accessible to all stakeholders interested in a more productive resource allocation, but also in the organization's competence to create value over time.

The newest one is the *integrated reporting* framework (commonly abbreviated <IR>), generally perceived as a necessary, forward-looking evolution of GRI sustainability reporting. The <IR> was aimed at disclosing financial and non-financial governance, performance and risk management in an integrated way within the same annual document. These integrated reporting guidelines show the broader and longer-term social and environmental consequences of decision-making, thus support the information needs of long-term investors (Synergiz, 2014).

An integrated report is defined as a concise communication on how the strategy, governance, performance and prospects of an organization lead to the creation of value over the short, medium and long term, in the context of its external environment. This concept of <IR> was primarily designed for the private sector, *but it can also be applied and adapted as necessary, by the public sector and not-for-profit organizations* (as paragraph 1.4 from the IIRC Framework clearly states)

(IIRC, 2013: 7). Nevertheless, the design of an integrated report is not as restrictive as the phrasing in the Framework appears to be. For instance, if we take a look at *Figure. 1*, which outlines the value creation process through <IR>, we can see that it is based on flows and elements that are similar in the public sector (such as capitals, activities, inputs, outputs, outcomes). Moreover, concepts such as value preservation and capital maintenance would suit well in the case of public sector entities (functioning as stewards for public goods).

As we can also observe in the model, a strong emphasis is placed on the six-tier capital structure (which, after all, is considered a fundamental concept of integrated reporting). According to the IIRC Framework (paragraph 2.10), *all organizations depend on various forms of capital for their success*. Thus, as a core element of integrated reporting, the six instances of the capitals should reflect the resource allocation and the impact of the public organization's activities (regarding outputs and outcomes). In the following section, we extend the analysis on each layer of the capitals and emphasize specific metrics which measure the disclosure level (first of all, for each layer in part and, ultimately, on an aggregate level – within our comprised disclosure index).

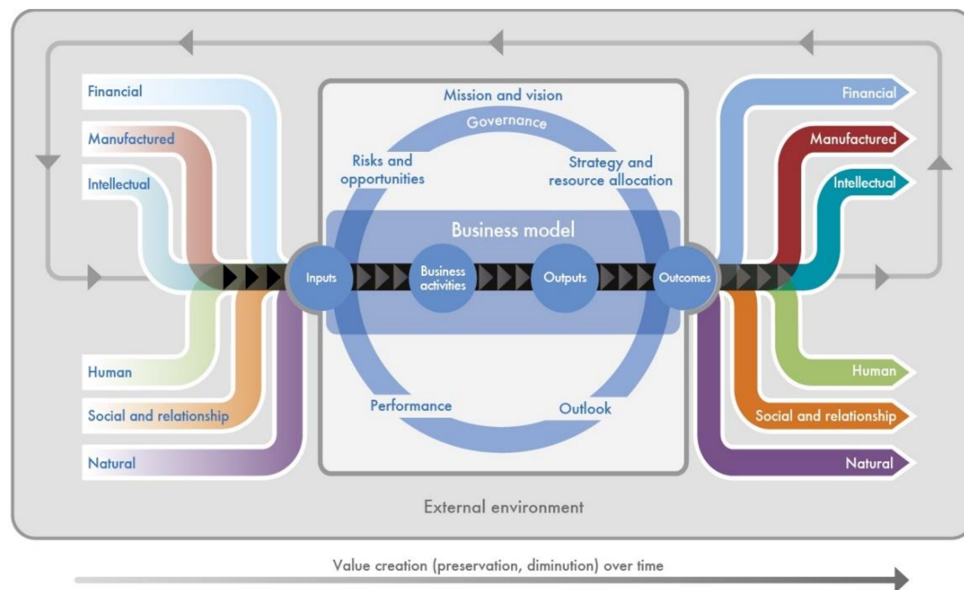

Figure 1. The value creation process and the capitals presented in the IIRC Framework
(Source: IIRC, 2013: 13*)*

However, it is not only the amount of data disclosed that makes an organization transparent, but also the quality and completeness of information. The existing

literature demonstrates that public sector agencies that provide a significant amount of inaccurate data can be considered less transparent than those disclosing brief but accurate and relevant information (Grimmelikhuijsen *et al.*, 2013). According to the frameworks mentioned above (IIRC and GRI) information disclosed must present qualitative characteristics to support an organization in achieving its objectives and presenting the whole picture of its activities. Therefore, the *"materiality"* (IR) applies to both financial and other information being integrated into the organization's management processes and involves identifying relevant matters based on their ability to affect value creation and regular engagement with providers of financial capital and others. *"Conciseness"* (IR) or *"clarity"* (GRI) enables users to comprehend the meaning of information disclosed and understood the organization's governance, strategy, and performance and is enhanced when information is structured and clearly presented. *"Reliability"* (both IR and GRI) is enhanced when information disclosed reflect a faithful representation of the phenomena that it refers to by gathering, recording, compiling, analyzing, and disclosing information in a way that could be subject to examination and free from material error or bias. *"Completeness"* (IR) or *"balance"* (GRI) is achieved when the report includes all material information, both positive and negative and involves acknowledging the extent of information disclosed and its level of specificity or preciseness. *"Consistency"* refers to maintaining the reporting policies from one period to the next unless a change is required to improve the quality of information disclosed. *"Comparability"* (both IR and GRI) enables users to identify similarities in, and differences between various sets of information for other periods of time but also allow for comparing similar information about other organizations. *"Accuracy"* (GRI) implies that the information should be authentic and detailed for stakeholders to estimate the organization's performance. *"Timeliness"* (GRI) is another qualitative characteristic of information and refers to having access to information in time for being able to have an impact on the decision-making process.

In conclusion, the existing frameworks (GRI and IR) include a variety of characteristics aimed at ensuring good communication, but regulating such practices does not always improve the quality of information disclosed because measures of quantity are often used in practice as a substitute for quality.

3. Disclosure index development

Aiming to achieve our goal, a disclosure index was developed for measuring both the quantity and quality of information provided to various stakeholders, as a useful key to enhancing transparency and discharging public accountability. Prior literature has recently highlighted an increasing demand for the public sector to

exercise greater social responsibility through the growing need for information (Galera *et al.*, 2014) to seek legitimacy from stakeholders, as long as its continuous existence depends on the stakeholders' support and approval. Because the information disclosed in financial statements proved long ago to be insufficient to satisfy user's needs, the concept of transparency was gradually expanded to other areas, such as the social and environmental aspects of corporate behavior (Gray, *et al.*, 1996).

Our paper approaches transparency from a consolidated view provided by the integrated reporting, the most recent global phenomenon that promises to provide a more cohesive and efficient framework (IIRC, 2013), combining different reporting strands such as the annual report and the voluntary sustainability reports (Rowbottom & Locke, 2016). Even if the key aim of the <IR> is to present a more holistic view of an organization's strategy, governance, performance and prospects, there is still little known about what form should the integrated report take to present the interconnectedness between the financial and non-financial information. Moreover, there is still uncertain how to link activities to environmental, social, or governance issues, so that the information provided to be relevant for the potential users (Cheng, *et al.*, 2014). However, the comments on the Consultation Draft of the <IR> Framework (IIRC, 2013) identified the Global Reporting Initiative's Sustainability Reporting Framework as the one with which it should align for creating further indicators or measurement methods.

Basing on this argument, our paper uses the Global Reporting Initiative (hereafter GRI) framework as a basis for the development of a disclosure index, due to its widely international recognition as a standard information guide for the sustainability of public organizations (Crognale, 2009). The GRI framework was designed to encourage economic, environmental and social performance disclosures in a comparable way, establishing a transparent and reliable exchange of sustainability information (GRI, 2010), aiming at increasing an organization's transparency and accountability, and thus contributing to gain stakeholders' trust. According to literature, in the recent years, there has been a considerable increase in the number of public organizations that use the GRI model (Dumay *et al.*, 2010; Tort, 2010), but there has been relatively little research over time into reporting practices based on this guideline (e.g. Dumay *et al.*, 2010; Farneti & Guthrie, 2009; Frost *et al.*, 2005 for environmental reporting; Ball & Bebbington, 2008, Guthrie *et al.*, 2010, Farneti & Siboni, 2011 for social reporting; respectively Pedrini, 2007 for intellectual capital reporting). However, evidence reveals that the indicators developed by GRI have been criticized on several grounds, including for being overly general and too numerous (Romolini, *et al.*, 2015). Basing on this shortcoming of the GRI framework, but at the same time motivated by the stakeholders' calls for enhanced disclosure, which can be provided by <IR>, we

decided to develop our disclosure index by overlapping the GRI indicators to be disclosed on the six capitals defined by the <IR>. Thus, the transparency index developed is used as an assessment for identifying whether an organization does or does not disclose an item from a pre-design list, comprising environmental, social, governance and other non-financial information, all provided by the <IR>. Prior studies often argued that such an index that measures the quantity of disclosure is in fact “a partial form of content analysis where the items to be studied are specified ex-ante” (Beattie, *et al.*, 2004), thus being a sound proxy for the quality, too (Beretta & Bozzolan 2008). However, we decided to develop two separate sub-indices for measuring quantitative and qualitative disclosures.

3.1 Quantitative disclosure index

The first part of our proposed aggregate disclosure level measurement tool is a quantitative disclosure index. This index is developed by overlapping the indicative metrics from the GRI guidelines (in this case, G4) and the structure of the six capitals. Thus, we obtained a checklist with six sub-indexes, one for each capital, the core structure of the quantitative disclosure index, being presented in Table 1.

Table 1. Structure of Quantitative disclosure index

Sub-index	Disclosure proxy items	Brief description and indicative metrics	References and identifiers	Score
Financial [100%]	Economic performance [33.33%]	Direct economic value generated and distributed	G4-EC1	8.33%
		Coverage of the organization’s defined benefit plan obligations	G4-EC3	8.33%
		Significant financial assistance received from government	G4-EC4	8.33%
		Indirect economic impacts	G4-EC7; G4-EC8	8.33%
	Financial costs incurred by externalities [33.33%]	Financial implications and other risks and opportunities for the organization’s activities due to climate change	G4-EC2	16.66%
		Total environmental protection expenditures and investments by type	G4-EN31	16.66%
	Financial accountability [33.33%]	Resource allocation	G4-NGO	11.11%
		Socially-responsible investment	G4-NGO	11.11%
		Ethical fundraising	G4-NGO	11.11%

Sub-index	Disclosure proxy items	Brief description and indicative metrics	References and identifiers	Score
Manufactured [100%]	Inputs and deliverables [50.00%]	Products and services	G4-PR1; G4-PR2; G4-PR3; G4-PR4	25.00%
		Materials	G4-EN1; G4-EN2	25.00%
	Tangible resources and infrastructure [50.00%]	Development and impact of infrastructure investments and services supported	G4-EC7	25.00%
		Information on buildings, equipment and other elements of infrastructure	IR Framework, paragraph 2.15	25.00%
Human [100%]	Work conditions [33.33%]	Occupational health and safety	G4-LA6; G4-LA7; G4-LA9; G4-LA10	11.11%
		Diversity and equal opportunity	G4-LA12	11.11%
		Equal remuneration for women and men	G4-LA13	11.11%
	Labor practices [33.33%]	Supplier assessment for labor practices	G4-LA14	16.66%
		Labor practices grievance mechanisms	G4-LA16; G4-NGO	16.66%
	Human rights [33.33%]	Human rights screening, assessment, trainings, policies and procedures	G4-HR1; G4-HR2; G4-HR9	3.70%
		Non-discrimination principle	G4-HR3	3.70%
		Freedom of association and collective bargaining	G4-HR4	3.70%
		Child labor	G4-HR5	3.70%
		Forced or compulsory labor	G4-HR6	3.70%
		Security practices	G4-HR7	3.70%
		Indigenous rights	G4-HR8	3.70%
		Supplier human rights assessment	G4-HR10; G4-HR11	3.70%
		Human rights grievance mechanisms	G4-HR12	3.70%
Intellectual [100%]	Innovation [20.00%]	Codified knowledge; Organizational Know-How; R&D; Technology transfer; New technology	Grimaldi *et al.* (2013)	20.00%
	Intangible infrastructural assets [20.00%]	Management processes; Organizational structure, Corporate culture; Procedures; Strategy; Vision; Internal collaboration	Grimaldi *et al.* (2013)	20.00%

Sub-index	Disclosure proxy items	Brief description and indicative metrics	References and identifiers	Score
	Information technology [20.00%]	Information systems; Databases; Communication; Technology; Systems; Documentation service	Grimaldi et *al.,* (2013)	20.00%
	Intellectual property [20.00%]	Patents; Copyright; Trademarks; Trade secrets	Grimaldi *et al.* (2013)	20.00%
	Organizational structures [20.00%]	Tacit knowledge, systems, internal procedures and protocols	IR Framework, paragraph 2.15	20.00%
Social and relationship [100%]	Product or service responsibility [33.33%]	Marketing communications	G4-PR6; G4-PR7; G4-NGO	11.11%
		Customer (or user) privacy	G4-PR8; G4-NGO	11.11%
		Compliance with regulations	G4-PR9	11.11%
	Program and policies effectiveness [33.33%]	Affected stakeholder engagement	G4-NGO	5.55%
		Feedback, complaints and action	G4-NGO	5.55%
		Monitoring, evaluation and learning	G4-NGO	5.55%
		Gender and diversity	G4-NGO	5.55%
		Public awareness and advocacy	G4-NGO	5.55%
		Program coordination	G4-NGO	5.55%
	Connections with society [33.33%]	Anti-corruption measures	G4-SO3→ SO5	4.76%
		Connections with local communities	G4-SO1; G4-SO2	4.76%
		Public policy	G4-SO6	4.76%
		Anti-competitive behavior	G4-SO7	4.76%
		Compliance with social regulations	G4-SO8	4.76%
		Supplier assessment of impacts on society	G4-SO9; G4-SO10	4.76%
		Grievance mechanisms for impacts on society	G4-SO11	4.76%
Natural [100%]	Environmental relationships [50.00%]	Eco-friendly measures (product and packaging recycling)	G4-EN28	12.50%
		Compliance with regulations	G4-EN29	12.50%
		Supplier environmental assessment	G4-EN32; G4-EN33	12.50%
		Environmental grievance mechanisms	G4-EN34	12.50%

Sub-index	Disclosure proxy items	Brief description and indicative metrics	References and identifiers	Score
	Environmental impact and use of resources [50.00%]	Impact mitigation of environmental impacts of products and services	G4-EN27	8.33%
		Transport	G4-EN30	8.33%
		Use of energy and water	G4-EN3→EN10	8.33%
		Biodiversity	G4-EN11→EN14	8.33%
		Emissions	G4-EN15→EN21	8.33%
		Effluents and Waste	G4-EN22→EN26	8.33%

* *Note*: The G4-NGO identifier makes reference to the Disclosures on Management Approach (DMA) from the G4 Sector Disclosures for NGOs (see GRI, 2014).

Thus, firstly, we regrouped the indicative metrics from G4, according to their similar characteristics and we constructed a series of disclosure proxies. In the last column of the table, we indicated the references and identifiers for each specific type of disclosure (in connection with the official GRI document, which offers extensive explanations and guidelines). Additionally, we synthesized and introduced several new metrics in the checklist from the GRI Sector Disclosure document for NGOs (GRI, 2014). Although these are not public sector entities, there are similarities which allow certain elements to be embedded in cross-sector reporting practices (following a rigorous analysis). Also, we complete information requirements for some of the capitals with typologies of items from the IIRC Framework (which are not encompassed by the GRI guidelines).

In the case of intellectual capital, we did not find concurrent metrics between the G4 guidelines and the extension of the term from the IIRC Framework (mostly because the GRI guidelines do not delineate very clearly the concept of intellectual capital). In this respect, we rely on the academic literature, acknowledging the fact that there is still a multitude of divergent definitions and measurement methods for intellectual capital (Petty & Guthrie, 2000; Marr *et al.*, 2004). Nevertheless, within our analysis, we selected a comprehensive structure of metrics (Grimaldi *et al.*, 2013), which follows the core delineation from the IIRC Framework.

This approach brings an element of novelty in assessing the aggregate disclosure level using the whole structure of the six capitals and leaving it unhindered (else said, without eliminating the intellectual capital for lack of indicative metrics in the GRI guidelines). The subcategories of intellectual capital included in the index are comprehensive enough to comprise all the instances mentioned by the IIRC Framework in paragraph 2.15. This approach brings an element of novelty in

assessing the aggregate disclosure level using the whole structure of the six capitals and leaving it unhindered (else said, without eliminating the intellectual capital for lack of indicative metrics in the GRIguidelines). The subcategories of intellectual capital included in the index are omprehensive enough to comprise all the instances mentioned by the IIRCFramework in paragraph 2.15.

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The value of the quantitative disclosure index for each capital is determined as an average score of the values of each disclosure proxy item. The score of each proxy is calculated according to the number of markers (or elements of disclosure) from each disclosure proxy. The disclosure value for each capital is estimated as the sum of all proxy items encompassed.

3.2 Qualitative disclosure index

The second part of this investigation continues with the development of a sub-index for determining the quality of the information disclosed by considering the qualitative characteristics of information proposed by both GRI and the <IR> framework. The quality of information relies upon the methods that the information is disclosed and allows stakeholders to reasonable assessments of the organization's performance and strategies for taking proper actions (GRI, 2014).

Prior literature has often analyzed the qualitative characteristics of information provided using a disclosure index (Sapkauskiene & Leitoniene, 2014; Hooks & van Staden, 2011), by applying different scales of weights (1-3 of 1-5) to disclosure indicators for estimating the quality of transparency. In this study, the quality level of the information provided is determined for all six pillars of the integrated

reporting - financial, manufactured, natural, intellectual, human, social and relationship capital. Further, the information comprised under each pillar has been analyzed by applying the qualitative characteristics of information recommended by GRI and <IR>. Moreover, each characteristic has been deconstructed into several aspects as presented in Table 2, thus a total of 32 criteria being pursued for further investigation.

Table 3. Structure of Qualitative disclosure index comprising assessment criteria

Materiality [1)2)3)4)] [100%]	**Completeness / balance** [3)] [100%]
- Relevant matters*) [25%]	- Favorable and unfavorable results**) [25%]
- Perspectives*) [25%]	- Format**) [25%]
- Quantitative and qualitative factors*) [25%]	- Proportionality**) [25%]
- Engagement*) [25%]	- Preciseness*) [25%]
Reliability [1) 3)] [100%]	**Timeliness** [3)] [100%]
- Original source of information**) [33.33%]	- Recent disclosure**) [33.33%]
- Reliable evidence**) [33.33%]	- Schedule**) [[33.33%]
- Employees activity*) [33.33%]	- Time period**) [33.33%]
Conciseness or clarity [4)] [100%]	**Comparability** [3)4)] [100%]
- Avoid unnecessary details**) [12.50%]	- Reporting frequency**) [20%]
- Access to information**) [12.50%]	- Benchmark**) [20%]
- Avoid unfamiliar terms**) [12.50%]	- Variations**) [20%]
- Glossary**) [12.50%]	- Ratios*) [20%]
- Accessibility needs**) [12.50%]	- Quantitative indicators*) [20%]
- Logical structure*) [12.50%]	
- Links*) [12.50%]	
- Clear concepts*) [12.50%]	
Consistency [100%]	**Accuracy** [100%]
- Key performance indicators*) [50%]	- Measurement techniques**) [33.33%]
- Explanations for changes*) [50%]	- Error level**) [33.33%]
	- Validity**) [33.33%]

*) IR / **) GRI
1) Leitoniene & Sapkauskiene (2015); 2) Habek & Wolniak (2016);
3) Bolivar *et al.*, (2015); 4) Chauvey, *et al.*, (2015)

Finally, for establishing the quality of disclosure, we applied the same encoding system as for quantitative index. Therefore, the maximum score for each qualitative characteristic is 1 or 100%. Further, the maximum score (1 or 100%) has been devided with the numer of items encompassed by each qualitative characteristic so as to determine the score for each item. If none of the items are present for a specific qualitative characteristic, it receives a score of 0. By using the binary coding system, we reduced the risk of extending the subjectivity of evaluation (Leitoniene & Sapkauskiene, 2015). The maximum value of each

qualitative characteristic of information is determined as the sum of all items encompassed. Therfore, the overall value of the qualitative disclosure is appreciated as the sum of all 32 criteria that have been evaluated.

4. Discussions and conclusions

In the past twenty years, the traditional perspective of the public sector has changed given the need to react to various pressures resulting from, globalization, evolving societies and stakeholders' expectations (Parker, 2013). Reforms have addressed all good governance objectives, seeking legitimacy, transparency, accountability and integrity (OECD, 2015).

Accountability has been the focus of many studies, and it remains a very complex concept, which is not yet fully understood. It expanded beyond the core definition of "being called to account for one's actions" (Mulgan, 2000), thus being perceived as the obligation of an organization to account and accept responsibility for its activities, and finally, to disclose the results in a transparent manner.

Reporting provides insights into how an organization views itself and its role in society. It creates commitments for improving future performance and establishes accountability for achieving goals (Krzus, 2011). Moreover, transparency in reporting, as an enabler of public accountability, is an important vehicle for building public trust. Because in public sector, stakeholders and society as a whole are the main recipient groups, this study addresses the theoretical underpinnings of the relationship between accountability and transparency starting from the agency theory that deals with the information asymmetry, followed by the stakeholders and the legitimacy theory that are highlighting its importance to the variety of potential users.

Public accountability has come under scrutiny as the new trends in reporting (e.g. sustainability / integrated reporting) are reaching the public sector. Recent studies (Bartocci & Picciaia, 2013; Cheng *et al.*, 2014) highlighted the key developments and implementations perspectives for the <IR> in the public sector and even synthesize hybrid forms of reporting (such as "integrated popular reporting"), as a mean for safeguarding accountability and transparency (Cohen & Karatzimas, 2015). Consequently, the <IR> might be helpful in considering the organization as a whole and unitary system, mainly oriented to creating value for a broad range of stakeholders (Vermiglio, 2012).

Based on this background, our study comes as a response to the need for a suitable tool aimed at measuring the degree of transparency in line with these latest developments in reporting. Thus, this paper provides an original instrument for

assessing disclosures in a public organization, based on the newest framework of integrated reporting.

The main contribution of this study relates to the methodology of developing the assessment tool based on overlapping the GRI indicators to be disclosed (frequently used in prior studies focused on measuring transparency) on the six capitals defined by the <IR>. The originality issue is the inclusion of the intellectual capital disclosure indicative metrics, which we synthesized from the literature (Grimaldi *et al.*, 2013), as we were unable to find specific disclosure elements mentioned in the GRI framework (G4 guidelines). This is an important focal point in the design of the index in its entirety as we intend to maintain the structure of the six capitals unhindered (in its original proposition issued by the IIRC). Moreover, this emulates the perspective for professional organizations and standard setters (such as GRI) to conduct an even more detailed breakdown of the pillars of sustainability (in terms of disclosure instances) and to issue specific guidelines and indicator database for intellectual capital (most of all because this topic has gained a lot of traction and interest in terms of delineation from both academics and practitioners alike).

Another aspect regarding the added value of this paper relates to the complexity of the disclosure index developed, comprising both quantitative and qualitative of disclosures. Thus, the quantitative measurement tool for disclosure level has a six-tier structure (mapped over the design of the six capitals from integrated reporting). Within this structure, we regroup the constituting elements of the GRI G4 guidelines (from a three-pillar construct to a six-pillar one), according to the category in which the indicative metrics can fit.

The main point which we emphasize by developing this index is that existing indicators and metrics (for both financial and non-financial information) can be used, in the context of a new reporting infrastructure (e.g. the six capitals from integrated reporting) to measure the amount of information disclosed by the public sector entities. However, many authors in this field focus on analyzing the disclosure level from the quantitative perspective by estimating only the amount of information disclosed. In our opinion, this is not sufficient to accurately determine the aggregate disclosure level of an entity. Therefore, our proposed disclosure index comprises a second qualitative sub-index for completing the first investigation (quantitative disclosure) and for increasing the relevance of the results.

The qualitative sub-index has been developed basing on GRI and IR recommendations, by deconstructing each characteristic into a total of 32 criteria. Although most prior studies are addressing the qualitative level of disclosure using a weighted scale, this research chooses to apply a binary measurement scale. The argument for this choice of model relies on the assumption that stakeholders'

abilities to analyze and process information are limited (Etzioni, 2010) and divergent. Therefore, we chose to use the binary model, even though it has been demonstrated that the scale of weights provides a more thorough analysis and better assessment of the quality level (Leitoniene & Sapkauskiene, 2015). In an attempt to avoid shaping the results by attaching a note of subjectivity, we appreciate that this decision might represent a limitation of this study.

In conclusion, this paper has deep practical implications, providing an assessment tool that can help public organizations willing to conduct a self-assessment and improve their reporting process, thus enhancing public accountability throughout greater transparency. Moreover, it might also be useful in the research environment, offering interesting opportunities for further empirical studies by applying and testing it in public organizations.

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